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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,736	06/18/2001	Michael Glotzer	0652.2260001/EKS/AES	8755

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EXAMINER
LI, RUIXIANG

ART UNIT	PAPER NUMBER
1646	13

DATE MAILED: 09/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/881,736	GLOTZER ET AL.	
	Examiner	Art Unit	
	Ruixiang Li	1646	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) *1-6 and 10-12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicants' election with traverse of Group I, claims 7 (in part) and 8-10, in Paper No. 9 is acknowledged. In response to election of species requirement, Applicants' elected the following species for prosecution: (i) human polypeptide CYK-4, set forth in SEQ ID NO: 2; (ii) human RhoA and human MKLP1 from claims 8 and 9; and (iii) the compound's ability to inhibit CYK-4 function, determined by the compound's ability to interfere with the biochemical interaction of CYK-4 and a member of the MLKP1 subfamily from claims 9 and 10.

The traversal is on the ground that the claims of Groups I and II can be examined without serious burden on the office. Applicants submit that the search of Groups I and II does not impose a serious burden upon the Examiner, as a search concerning the patentability of one group is likely to uncover art of interest to the other group. This is not found persuasive because Invention I requires measuring the compound's ability to modulate the function of CYK-4, whereas Invention II requires measuring the compound's ability to interfere with the biochemical multimerization of a member of the MKLP1 subfamily. Each method is unique and not required by the other. Even if a search of Group I could uncovers art of interest to Group II, examination of both groups still requires separate considerations. Thus, examination of more than one group of inventions constitutes an undue burden on the office.

The requirement is still deemed proper and is therefore made FINAL.

2. The preliminary amendment in Paper No. 13 filed on May 15, 2002 has been entered in full. Claims 1-12 are pending. Claims 7-9 are under consideration and all other claims are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Priority

3. Acknowledgment is made of a claim for domestic priority under 35 U.S.C. 119(e) to a provisional application, 60/241,231, filed on October 18, 2000.

Acknowledgment is also made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copies have been placed of record in the file.

It is also noted that the Bibliographic Data Sheet of the Application has been corrected to reflect Applicant's claim on the benefit of 60/297,434, 06/13/2001.

Drawings

4. The drawings filed on June 18, 2001 are accepted by the Examiner.

Information Disclosure Statements

5. The Office record indicates that Applicant has submitted Information Disclosure Statements in Paper No. 6 on January 8, 2002. However, the Examiner has not been able to find the PTO-1449 form. Applicant is requested to submit a copy of the Information Disclosure Statements submitted earlier and the references listed in the form.

Claim Rejections—35 USC § 112, 1st paragraph

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 7-9 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method for identifying a modulator of human CYK-4 of SEQ ID NO: 2 by determining the compound's ability to promote GTP hydrolysis by human Rho and to inhibit the binding of the human CYK-4 and human MKLP1, does not reasonably provide enablement for (i) a method for identifying a compound capable of modulating cytokinesis using ***fragments or variants*** of human CYK-4 of SEQ ID NO: 2; (ii) a method for identifying a compound capable of modulating cytokinesis by measuring the compound's ability to modulate ***the function of CYK-4***; and (iii) a method for identifying a compound capable of modulating cytokinesis by measuring the compound's ability to ***interfere with the biochemical interaction*** of CYK-4 and a member of the MKLP1 subfamily. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The factors that are considered when determining whether a disclosure satisfies enablement requirement include: (i) the quantity of experimentation necessary; (ii) the amount of direction or guidance presented; (iii) the existence of working examples; (iv) the nature of the invention; (v) the state of the prior art; (vi) the

relative skill of those in the art; (vii) the predictability or unpredictability of the art; and (viii) the breadth of the claims. *Ex Parte Forman*, 230 USPQ 546 (Bd Pat. App. & Int. 1986); *In re Wands*, 858 F. 2d 731, 8 USPQ 2d 1400 (Fed. Cir. 1988).

The breadth of the claims. The claims recite a method for identifying a compound capable of modulating cytokinesis by determining the compound's ability to modulate the function of CYK-4, to promote GTP hydrolysis by a Rho family GTPase, and to interfere with the biochemical interaction of CYK-4 and a member of the MKLP1 subfamily. Thus, the claims encompass a method using any fragments or variants of human CYK-4 of SEQ ID NO: 2 (see page 21 of specification for definition of CYK-4), and measuring any functions of CYK-4, and determining any biochemical interaction of CYK-4 and a member of the MLKP1 subfamily. However, the specification merely discloses a method for identifying a modulator of human CYK-4 of SEQ ID NO: 2 by determining the compound's ability to promote GTP hydrolysis by human Rho and to inhibit the binding of the human CYK-4 and human MKLP1. There is no disclosure of any fragments or variants of SEQ ID NO: 2 that retains the activity of SEQ ID NO: 2. There is no disclosure of a method for identifying modulators of cytokinesis by determining other biological functions. In this regard, it is noted that CYK-4 or MgcRacGAP has been demonstrated to play key roles in controlling growth and differentiation of hematopoietic cells (Blood 96: 2116-2124, 15 September 2000). Clearly, the specification fails to enable a method for identifying a compound capable of modulating cytokinesis by determining the compound's ability to modulate growth and differentiation of hematopoietic cells.

Nature of the invention and the state of the prior art. The process of

cytokinesis produces two daughter cells from a single parent cell and permanently segregates the products of the cell division cycle. Thus, cytokinesis is one complicated biological process, which involves numerous regulatory factors, including the mammalian CYK-4 polypeptides described in the instant specification. There is only one report in the art regarding the roles of human CYK-4 polypeptide of SEQ ID NO: 2 (also known in the art as MgcRacGAP) in the control of growth and differentiation of hematopoietic cells (Blood 96: 2116-2124, 15 September 2000). There are no studies in the art on the variants or fragments of human CYK-4 of SEQ ID NO: 4 or the use of such variants and fragments in a screening method for identification of a modulator of cytokinesis.

The amount of direction or guidance presented and the existence of working examples. Despite the fact that the specification provides sufficient guidance on how to make and use the modulators of human CYK-4 polypeptide of SEQ ID NO: 2, the specification fails to provide sufficient direction or working examples on how to make modulators of cytokinesis using variants and fragments of human CYK-4 polypeptide of SEQ ID NO: 2. One skilled in the art would first have to determine the activity of fragments or variants of human CYK-4 polypeptide of SEQ ID NO: 2 in order to develop the claimed assay. While providing a number of active fragments of murine CYK-4 of SEQ ID NO: 4, which shares 84.3% sequence identity with SEQ ID NO: 2, the specification provides no guidance specific to the fragments and variants of SEQ ID NO: 2. For example, the specification is silent with respect to which amino acid residues or regions are critical for promoting GTP hydrolysis by a Rho family GTPase and for the binding of CYK-4 of SEEQ ID NO: 2 and human MKLP1, and which

residues may be altered without loss of activity.

The relative skill of those in the art, the predictability or unpredictability of the art, and the quantity of experimentation necessary. Although one skilled in the art certainly has the technology and skills to carry out a general screening method, the fact that only one article reports the potential role of human CYK-4 polypeptide of SEQ ID NO: 2 in the control of growth and differentiation of hematopoietic cells but there is no studies on the functional role of the human CYK-4 polypeptide of SEQ ID NO: 2 in cytokinesis indicates the complexity of the work in this research area. The information available in the art and disclosed in the instant specification, while useful to a certain degree, would not be sufficient to help to predict whether a variant or fragment of human CYK-4 polypeptide of SEQ ID NO: 2 retains the activity of SEQ ID NO: 2 and can be used in the claimed screening assay for identifying a compound capable of modulating cytokinesis. Without sufficient guidance to make such active variants and fragments, it would take undue experimentation for one skilled in the art to make and use the claimed method.

Accordingly, the instant disclosure fails to enable the screening methods encompassed by the instant claims. It would require undue experimentation for one skilled in the art to make and use the claimed invention.

Claim Rejections—35 USC § 112, 2nd paragraph

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 7-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7-9 are indefinite for the following reasons:

(i) the steps of the methods do not necessarily achieve the goal set forth in the claim preamble. It is unclear how a candidate modulator is selected, determined, and correlated to the preamble.

The Examiner notes that a method usually has a contacting step, a detecting step, a selecting step, and a correlation step linking the detection/selection step to the goal set forth in the preamble.

(ii) claims 7-9 recite the terms "CYK-4" and "MKLP1". Such acronyms are determined arbitrarily and may change with time. For clarity, it is suggested that the terms be spelled out in each independent claim. It is also suggested that CYK-4 be modified by SEQ ID NO: 2 for clarity.

(iii) claim 7 recites the term "the function of CYK" whereas claim 9 recites "the biochemical interaction". Neither the art nor the specification provides an unambiguous definition for the terms. It is unclear what are the metes and bounds of the terms. For example, it is unclear what biochemical interaction else, in addition to binding, is encompassed in claim 9.

Claim Objections—Minor Informalities

10. Claims 7-9 are objected to because they recite unelected subject matter. Appropriate correction is required.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ruixiang Li whose telephone number is (703) 306-0282. The examiner can normally be reached on Monday-Friday, 8:30 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler, can be reached on (703) 308-6564. The fax phone number for this Group is (703) 305-3014 or (703) 308-4242.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [yvonne.eyler@uspto.gov].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Ruixiang Li
Examiner
September 3, 2003

JANET ANDRES
PATENT EXAMINER